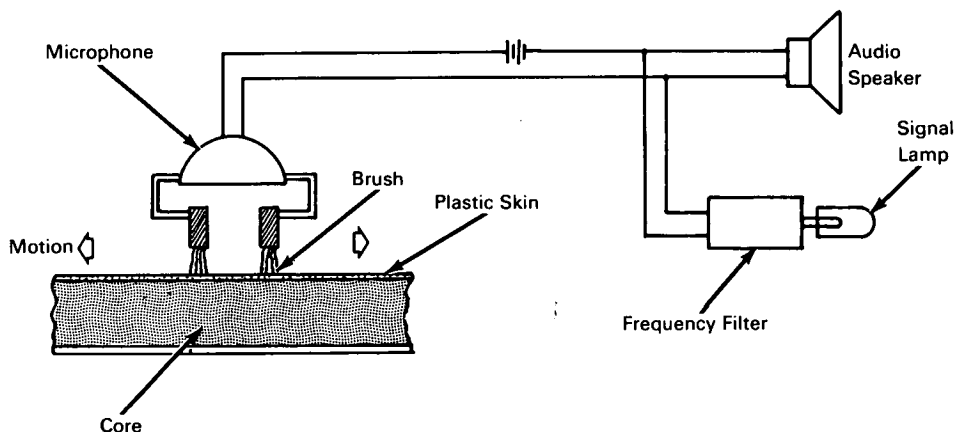


# NASA TECH BRIEF



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## Device Detects Unbonded Areas In Plastic Laminates



**The problem:** To develop a nondestructive quality-control method for detecting unbonded or delaminated areas in plastic laminates.

**The solution:** A device that generates an acoustic signal whose frequency changes in the presence of delaminated or weakly bonded areas in the laminate are picked up by a microphone.

**How it's done:** The acoustic device consists of a circular metallic brush which is moved laterally across the laminated surface. This motion produces a scratching sound which changes in frequency as the brush encounters a change in bonding characteristics. The sound is picked up by a small microphone connected to a speaker which gives an audible indication of the frequency change. The microphone output can also be fed to a filter which passes only frequencies associated with defective areas to actuate a signal light.

### Notes:

1. The device was originally designed to detect unbonded areas between 0.004" - to 0.010"-thick plastic skins and glass fiber reinforced foam cores. It could, however, be applied to other laminated structures having thicker skins (plastic or metallic) and other core materials by modifying the stiffness and shape of the metallic brush and by changing the pass band of the frequency filter.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Western Operations Office  
150 Pico Boulevard  
Santa Monica, California, 90406  
Reference: B65-10380

(continued overleaf)

**Patent status:** NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

Source: Douglas Aircraft Company, Inc.  
under contract to  
Western Operations Office  
(WOO-206)